
Space Weather Forecast

Issued on Tuesday, 07 March 2023 at 12:28 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Moderate class flares (R1-R2/Minor-Moderate radio blackouts) likely. Slight chance of G1/Minor Storm intervals 07-09 March.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate in the last 24 hours with one low level Moderate-class flare from a region near north centre disc, which is one of the largest regions on the disc. It has some magnetic complexity. Another region of interest is in the southeast, which has continued to grow with the leading and trailing spot penumbra starting to merge to form some magnetic complexity. The region which was the source of two R2 blackouts on the 05 and 06 March, is now near the west limb and difficult to assess. There are now twelve sunspot regions on the visible disc, but the remaining regions are all relatively simple or evolving slowly. No Earth directed Coronal Mass Ejections (CMEs) were observed in available imagery during the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind has been indicative of a continuing coronal hole fast wind. Wind speeds were at elevated to strong levels, varying between 530-700 km/s. The total Interplanetary Magnetic Field was weak, with the north-south component also varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp 2 to 3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be mainly Low to Moderate, with a slight chance of Strong activity. The main risk of flares is from the larger regions with a declining risk from a region near the west limb.

Solar Wind / Geomagnetic Activity: There is one possible glancing CME currently forecast on 07 or 08 March, but with low confidence. Earth is experiencing strong solar wind speeds under the influence of a coronal hole fast wind. The fast wind is expected to start to wane through Days 1 and 2 (07-08 Mar), but elevated wind speeds are likely to be prolonged by a smaller coronal hole which could connect on Days 2 or 3 (08-09 Mar).

Geomagnetic activity is expected to be Quiet to Unsettled throughout the period, with a declining risk of Active or G1/Minor Storm intervals, mainly due to any glancing CME effects or the onset of coronal hole 82.

Energetic Particles / Solar Radiation: Solar radiation levels are most likely to stay at background levels, but with a slight chance of reaching the S1/Minor Storm threshold or greater should any larger flares occur.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	20	20	10	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)